

CLAIMS

1. An infrared detecting device, comprising:

a pyroelectric element which generates a current signal based on incoming infrared radiation;

5 an I/V conversion circuit which converts said current signal into a voltage signal;

a voltage amplification circuit which selectively amplifies components with prescribed frequencies of said voltage signal to issue a components-amplified voltage;

10 a detection circuit which provides a comparison between the components-amplified voltage and a prescribed detection threshold voltage to issue a detection signal of the infrared radiation;

an output circuit which issues an output signal based on to the detection signal; and

15 a drive power supply circuit which supplies a drive current to each of signal circuits comprised of the I/V conversion circuit, the voltage amplification circuit, the detection circuit and the output circuit;

wherein said drive power supply circuit is comprised of:

20 a current generating circuit which includes a reference current source, a fixed current source and a variable current source, said reference current source being configured to generate a reference current, said fixed current source being configured to provide a fixed current based on said reference current, said variable current source being configured to provide a variable current varying with said reference current; and

25 a distribution circuit configured to distribute the drive current to a

part of said signal circuits based on the current from said fixed current source, said distribution circuit being configured to distribute the drive current to the remaining part of said signal circuits based on the current from said variable current source.

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2. The infrared detecting device of claim 1, wherein said drive power supply circuit comprises a plural of the variable current source, each of said variable current sources being individually connected to each circuit of said remaining part of the signal circuits.

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3. The infrared detecting device of claim 1, wherein:

said drive power supply circuit comprises a terminal for receiving a changeover signal; and

said variable current source steps the variable current up or down to any of prescribed different currents in accordance with the changeover signal received at said terminal.

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4. The infrared detecting device of claim 1, wherein said variable current source steps the variable current up or down to any of prescribed different currents based on variation of power voltage.

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5. The infrared detecting device of claim 1, wherein said variable current source steps the variable current up or down to any of prescribed different currents based on variation in ambient temperature.

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6. The infrared detecting device of claim 1, wherein:

the voltage amplification circuit comprises a differential stage and an output stage;

the distribution circuit distributes the drive current to the differential stage or the output stage based on the current from said variable
5 current source, or distributes same or different current as the drive current to the differential stage and the output stage based on the current from said variable current source.

10 7. The infrared detecting device of claim 1, further comprising a suppression circuit, wherein:

said drive power supply circuit comprises a current changeover circuit, said current changeover circuit being configured to provide a first changeover signal to said variable current source when said
15 components-amplified voltage is closer to a reference level than a transition threshold voltage, said transition threshold voltage being set to be closer to the reference level than said detection threshold voltage, said current changeover circuit being configured to provide a second changeover signal to said variable current source when said components-amplified voltage is
20 further from the reference level than the transition threshold voltage;

said variable current source configured to step the variable current down to a current smaller than a rated current of prescribed different currents based on said first changeover signal, said variable current source being configured to step the variable current up to the rated current based on
25 said second changeover signal; and

said suppression circuit configured to start suppression of output of any circuit or circuits included in said signal circuits in order to suppress said output signal from a start point in time on or before which said variable current source steps up or down the variable current, said suppression circuit being configured to release the suppression after a prescribed time period.

8. The infrared detecting device of claim 7, wherein said suppression circuit comprises:

10 a resistor which is connected in series between said voltage amplification circuit and said detection circuit;

a constant voltage supply circuit for supplying a constant voltage between said resistor and said detection circuit;

15 a switch that is connected between from said constant voltage supply circuit to said resistor and said detection circuit, said switch being configured to open or close a pathway from said constant voltage supply circuit to said resistor and said detection circuit in response to OFF or ON signal respectively; and

20 a switch controlling circuit configured to provide the ON signal to said switch from said start point, said switch controlling circuit being configured to provide the OFF signal to said switch after said time period.

9. The infrared detecting device of claim 7, wherein:

25 said voltage amplification circuit comprises an operational amplifier and a feedback resistor, said operational amplifier having a positive input

terminal, a negative input terminal and an output terminal, said feedback resistor being connected between said output terminal and one of said input terminals; and

said suppression circuit comprises a switch and a switch controlling circuit, said switch being connected in parallel with said feedback resistor, said switch being configured to open or close its parallel pathway in response to OFF or ON signal respectively, said switch controlling circuit being configured to provide the ON signal to said switch from said start point, said switch controlling circuit being configured to provide the OFF signal to said switch after said time period.

10. The infrared detecting device of claim 7, wherein said suppression circuit comprises:

a resistor;

15 a switch that is connected between said voltage amplification circuit and said detection circuit, said switch being configured to open or close a pathway from said voltage amplification circuit to said detection circuit in response to OFF or ON signal respectively;

a constant voltage supply circuit which supplies a constant voltage between said switch and said detection circuit through said resistor; and

20 a switch controlling circuit configured to provide the OFF signal to said switch from said start point, said switch controlling circuit being configured to provide the ON signal to said switch after said time period.

25 11. The infrared detecting device of claim 7, wherein said

suppression circuit comprises:

a constant voltage supply circuit for supplying a constant voltage to said detection circuit;

a switch that is connected between from said constant voltage supply circuit and said voltage amplification circuit to said detection circuit, said switch being configured to close or open a pathway between said constant voltage supply circuit and said detection circuit in response to suppression or unsuppression signal respectively, said switch being configured to open or close a pathway between said voltage amplification circuit and said detection circuit in response to the suppression or the unsuppression signal respectively; and

a switch controlling circuit configured to provide the suppression signal to said switch from said start point, said switch controlling circuit being configured to provide the unsuppression signal to said switch after said time period.

12. The infrared detecting device of claim 7, wherein said suppression circuit comprises:

a switch that is connected between said detection circuit and said output circuit, said switch being configured to open or close a pathway between said detection circuit and said output circuit in response to OFF or ON signal respectively; and

a switch controlling circuit configured to provide the OFF signal to said switch from said start point, said switch controlling circuit being configured to provide the ON signal to said switch after said time period.

13. The infrared detecting device of claim 7, wherein said switch controlling circuit issues:

5 said second changeover signal so that said variable current source increases the variable current to the biggest rated current while stepping up from smallest current of the different currents according to the second changeover signal, and

10 said first changeover signal so that said variable current source decreases the variable current to the smallest current while stepping down from the rated current of the different currents according to the first changeover signal.